Application No. 10/723,619   Customer No. 01933
Response to Office Action

Listing of Claims:

1.   (Currently Amended) An inkjet recording head for
ejecting ink, comprising:

a plurality of sidewalls, which comprise a piezoelectric
material, and which ~~to~~ form a plurality of ink channels separated

5   by the plurality of sidewalls; ~~, the plurality of sidewalls~~
~~comprising at least partially a piezoelectric material,~~

a bottom plate, which comprises a piezoelectric material,
and which forms ~~to form~~ a bottom face of the plurality of ink
channels; ~~, the bottom plate comprising a piezoelectric material,~~

10   and

a plurality of electrodes formed on the plurality of side
walls, ~~for being applied~~ to which an electric voltage is
applied to cause a pressure change in the plurality of ink
channels by shear deformation of the plurality of sidewalls, ~~and~~

15   so as to eject the ink in the plurality of ink channels;

wherein all of the plurality of ink channels are divided
into at least two ~~or more~~ groups of ink channels, ~~where a~~ and
each said group of ink channels ~~is composed of~~ comprises ink
channels ~~between which~~ having at least one of the plurality of

20   ink channels ~~is~~ not in the group sandwiched therebetween; and

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wherein an ink ejection operation is performed successively
in a time-sharing mode for each of the ~~group~~ groups of ink
channels, while satisfying ~~the condition~~ conditions: ~~of~~

|CTC + CTE| ≤ 10 (%) and |CTE| ≥ 5(%)_, [[;]]

25   where CTC is a crosstalk between ink channels in one
group of ink channels due to a compliance ratio of the plurality
of sidewalls to the ink in the plurality of ink channels, ~~channel~~
~~is CTC,~~ and CTE is a crosstalk between ink channels in one group
of ink channels due to a leak of an electric field caused by the

30   electric voltage applied to the plurality of electrodes is CTE_,
and wherein CTC and CTE have a canceling effect on each other.

        2.   (Currently Amended) The inkjet recording head of
claim 1, wherein each of the plurality of sidewalls comprises two
layers of piezoelectric material laminated via a contact face,
and each of the two layers ~~being~~ is polarized differently

5   ~~different with each other in the~~ in a direction perpendicular to
the contact face.

        3.   (Currently Amended) The inkjet recording head of
claim 1, wherein the plurality of electrodes ~~are present in a~~
~~range~~ have a height of at least a/2 ~~high~~ extending from the
bottom face of the plurality of ink channels, where a is an ink
flow path width of each of the plurality of ink channels ~~is a~~.

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    4.   (Currently Amended) The inkjet recording head of
claim 1, wherein the plurality of the electrodes are formed by
~~means of~~ a plating method.

    5.   (Currently Amended) The inkjet recording head of
claim 1, wherein each of the plurality of ink channels has an ink
flow path width of not greater than 100 μm, and <u>an</u> ink channel
depth of not greater than 300 μm.

    6.   (Currently Amended) The inkjet recording head of
claim 1, wherein the plurality of ink channels are formed ~~of~~ <u>by</u>:
    a substrate, on which a plurality of grooves are formed ~~,~~
~~the grooves being~~ <u>that are</u> separated by the plurality of

5 sidewalls<u>;</u> ~~comprising at least partially a piezoelectric~~
~~material,~~ and
    a cover plate adhered to ~~the~~ top ~~face~~ <u>faces</u> of the plurality
of sidewalls;
    wherein ~~the~~ <u>a</u> thickness of <u>the</u> piezoelectric material at the

10 bottom face of each of the plurality of ink channels is at
least 10 μm.

    7.   (Currently Amended) The inkjet recording head of
claim 5, wherein the plurality of ink channels are formed ~~of~~ <u>by</u>:

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a substrate, on which a plurality of grooves are formed ~

~~the grooves being~~ that are separated by the plurality of

5   sidewalls; ~~comprising at least partially a piezoelectric~~

~~material,~~ and

a cover plate adhered to ~~the~~ top ~~face~~ faces of the plurality

of sidewalls;

wherein ~~the~~ a thickness of the piezoelectric material at the

10   bottom face of each of the plurality of ink channels is at

least 10 μm.

8.   (Currently Amended) The inkjet recording head of

claim 1, wherein ~~the~~ a density of the plurality of ink channels

is at least 150 dpi.

9.   (Currently Amended) The inkjet recording head of

claim 7, wherein ~~the~~ a density of the plurality of ink channels

is at least 150 dpi.

10.   (Currently Amended) The inkjet recording head of

claim 1, wherein ~~the~~ a density of the plurality of ink channels

is at least 300 dpi.

11.   (Currently Amended) The inkjet recording head of

claim 7, wherein ~~the~~ a density of the plurality of ink channels

is at least 300 dpi.

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12.   (Currently Amended) ~~The~~ An inkjet recording head ~~of~~

~~claim 1,~~ for ejecting ink, comprising:

a plurality of sidewalls, which comprise a piezoelectric

material, and which form a plurality of ink channels separated by

5   the plurality of sidewalls;

a bottom plate, which comprises a piezoelectric material,

and which forms a bottom face of the plurality of ink

channels; and

a plurality of electrodes formed on the plurality of side

10   walls, to which an electric voltage is applied to cause a

pressure change in the plurality of ink channels by shear

deformation of the plurality of sidewalls, so as to eject the ink

in the plurality of ink channels;

wherein all of the plurality of ink channels are divided

15   into at least two groups of ink channels, and each said group of

ink channels comprises ink channels having at least one of the

plurality of ink channels not in the group sandwiched

therebetween;

wherein an ink ejection operation is performed successively

20   in a time-sharing mode for each of the groups of ink channels,

while satisfying a condition:

$|CTC + CTE| \leq 10$ (%) and $|CTE| \geq 5$ (%),

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    <u>where CTC is a crosstalk between ink channels in one</u>

<u>group of ink channels due to a compliance ratio of the plurality</u>

25   <u>of sidewalls to the ink in the plurality of ink channels, and CTE</u>

<u>is a crosstalk between ink channels in one group of ink channels</u>

<u>due to a leak of an electric field caused by the electric voltage</u>

<u>applied to the plurality of electrodes is CTE; and</u>

    wherein ~~the~~ <u>a product of a</u> density of the plurality of ink

30   channels (dpi) and ~~the~~ <u>a</u> depth of said plurality of ink channels

(μm) ~~satisfies the following relation: the density (dpi) x the~~

~~depth (μm)~~ ~~≤~~ <u>is less than or equal to</u> 5.5 x 10^4.

    Claims 13-16 (Canceled).

    17.   (Currently Amended) The inkjet recording head of

claim 1, wherein all of the plurality of ink channels are divided

into three <u>of said</u> groups of ink channels<u>.</u> ~~, where a group of ink~~

~~channels is composed of ink channels between which two of the~~

~~plurality of ink channels is sandwiched.~~

    18.   (Currently Amended) The inkjet recording head of

claim 12, wherein all of the plurality of ink channels are

divided into three <u>of said</u> groups of ink channels<u>.</u> ~~, where a~~

~~group of ink channels is composed of ink channels between which~~

~~two of the plurality of ink channels is sandwiched.~~

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     19. (New) The inkjet recording head of claim 12, wherein each of the plurality of ink channels has an ink flow path width of not greater than 100 µm, and an ink channel depth of not greater than 300 µm.

     20. (New) The inkjet recording head of claim 12, wherein the plurality of ink channels are formed by:

     a substrate, on which a plurality of grooves are formed that are separated by the plurality of sidewalls; and

5   a cover plate adhered to top faces of the plurality of sidewalls;

     wherein a thickness of the piezoelectric material at the bottom face of each of the plurality of ink channels is at least 10 µm.

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